REMARKS

Claims 23-40 and 42-54 are pending in the Subject Application; of these claims 23-35 and 44-54 are withdrawn from consideration and 36-40, 42, and 43 are rejected.

REJECTIONS

In the Office Action, the Examiner rejects claims 36-40, 42, and 43 under 35 U.S.C. §103(a) as being unpatentable over United States Patent No. 6,613,468 issued to Simpkins ("Simpkins") in view of JP 2000-294256 filed by Taruya et al. ("Taruya").

Applicant has amended independent claim 36 to include the limitation that the claimed solid oxide fuel cell ("SOFC") comprises an interconnect providing a current pathway from the anode, the interconnect comprising a *uncoated* ferritic stainless steel. Applicant respectfully submits that amended claim 36 and its dependent claims 37-40, 42, and 43 are patentable over Simpkins in view of Taruya.

The amendment is supported by the specification as filed. Though the specification does not explicitly state the ferritic stainless steel is uncoated, one skilled in the art would know from reading the specification as filed that the claimed ferritic stainless steel has the advantage that it may be used in a solid oxide fuel cell uncoated. The disclosure never indicates that the ferritic stainless steel needs or should be coated for application in the SOFC and all the examples present in the specification as filed test the uncoated ferritic stainless steel.

> It is clearly stated in MPEP § 2163.02 that:
>
> **The subject matter of the claim need not be described literally (i.e., using the same language or in haec verba) in order for the disclosure to satisfy the description requirement.**
>
> and, per MPEP § 2163.07(a):
>
> **By disclosing in a patent application a device that inherently performs a function or has a property, operates according to a theory or has**

> **an advantage, a patent application necessarily discloses that function, theory or advantage, even though it says nothing explicit concerning it. The application may later be amended to recite the function, theory or advantage without introducing new matter. In re Reynolds, 443 F.2d 384, 170 USPQ 94 (CCPA 1971); In re Smythe, 480 F.2d 1376, 178 USPQ 279 (CCPA 1973).**

Therefore, Applicants respectfully submit that the claim amendment indicating that the ferritic stainless steel is uncoated does not add new matter to the claimed invention.

In order to analyze whether the amended claim is obvious, the MPEP states that there are three basic criteria that must be met to result a *prima facie* case of obviousness in United States patent law. First, there must be some suggestion or motivation, either in the references or in the knowledge generally available in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references must teach or suggest all of the claim limitations. *See* Manual of Patent Examining Procedure ("MPEP") § 2143. Applicants respectfully submit that a *prima facie* case of obviousness may not be made on the amended claims by the combination of references cited in the Office Action, for at least the reasons that there would be no reasonable expectation of success and a combination of the references does not teach all of the claim limitations.

Applicant respectfully submits that the claims as amended in this response are patentable over the cited references. In the Office Action, the Examiner states that Simpkins teaches a SOFC comprising an interconnect. The interconnect is electrically conductive and may comprise a ferritic stainless steel material (6:46-67). However, the cited section of Simpkins more specifically states that "[a]lso, metals, such as ferritic stainless steels, nickel, chrome, aluminum alloys, may be coated with LSC or strontium-doped lanthanum manganite (LSM) to achieve the same desired properties." *See* Simpkins 6:60-67. Simpkins discloses use of *coated* ferritic stainless steels

that may be used as interconnects in solid oxide fuel cells, thereby teaching away from an uncoated stainless steel with the claimed composition.

In this regard, based upon the teachings of Simpkins and Taruya there would be no reasonable expectation of success to use an uncoated ferritic stainless steel in a solid oxide fuel cell and a combination of the references does not teach all of the claim limitations. One skilled in the fuel cell are would not be motivated to combine the disclosures of Simpkins and Taruya due to the significant differences between the Polymer Electrolyte Membrane ("PEM") fuel cells of Taruya and the SOFC's of Simpkins. These differences are described in the previous Response to Office Action filed on November 16, 2005 and are not repeated in this Response.

It, however, bears repeating that the disclosure of Taruya teaches that components for one type of fuel cell are not capable of being used in a different type of fuel cell and actually teaches away from the use of the disclosed ferritic stainless steel separators other fuel cells. Taruya teaches that "[w]ith each of the aforementioned types of fuel cells, in cases when we think about the individual constituent materials of items that are referred to by the common name of 'fuel cell,' *it is necessary for them to be batched as completely different things.*" Taruya at [0005] (emphasis added). This is because the operating conditions within the fuel cell are completely different for each fuel cell type. Accordingly, "it is not possible to consider the application of materials used in commercialized phosphoric acid-type fuel cells and fused carbonate-type fuel cells in the constituent material of a solid polymer-type fuel cell." Taruya at [0006].

Thus, Taruya teaches that there would be no reasonable expectation of success in using components designed for use in one type of fuel cell in other types of fuel cells. Accordingly, Applicant submits that one skilled in the art, in reading the disclosures of Simpkins and Taruya would not be motivated to use the disclosed ferritic stainless steel separator for a PEM fuel cell in an SOFC, and further, in view of the teachings of Simpkins and Taruya, one skilled in the art would have no reasonable expectation of the success of such a combination. Since Simpkins teaches that ferritic stainless steels must be coated to be appropriate for use in SOFC's. Therefore, Applicant submits

that the amended claims are not rendered obvious by the disclosure of Simpkin in view of the disclosure of Taruya.

Further, Taruya does not disclose a ferritic stainless steel that meets the limitation in the amended claims that "$0.5 \leq (\%Nb + \%Ti + \frac{1}{2}(\%Ta)) \leq 1$ in either the broad descriptions of the alloys or in the alloys of Table 1. Taruya teaches that it is generally not desirable in increase the amounts of the Ti and Nb in the disclosed ferritic stainless steels beyond that specified ranges and thus Applicant submits that Taruya actually teaches away from using an amount of Ti, Nb, and Ta that would satisfy the equation set forth in claim 36. Consequently, one skilled in the art in reading the disclosure of Taruya would not be motivated to formulate a ferritic stainless steel for use as a separator in any type of fuel cell wherein the ferritic stainless steel contained an amount of at least one of Ti, Nb, and Ta as set forth in amended claim 36.

Consequently, Applicant respectfully submits that Simpkin in view of Taruya neither anticipates nor renders obvious claim 36 or any of the claims that depend therefrom, and requests that the Examiner reconsider the patentability of the pending claims.

Further, the Examiner rejects claims 36-40, 42, and 43 under 35 U.S.C. §103(a) as being unpatentable over United States Patent No 6,828,055 issued to Kearl ("Kearl") in view of Internet printouts for Haynes 55TM Alloy ("556"), and/or Haynes 263TM Alloy ("263") and/or Haynes HR-120TM Alloy ("120"). As the Examiner states Kearl does not explicitly teach the use of a ferritic stainless steel alloy of the claimed invention and combines the teaching of Kearl with the disclosures of 556, 263, and 120 to provide the claimed invention. Applicants respectfully traverse this rejection since the 556, 263, and 120 are not ferritic stainless steels.

There are different types of stainless steels, typically defined as ferritic, austenitic, martensitic, and duplex. Ferritic stainless steels are highly corrosion resistant, but far less durable than austenitic grades and cannot be hardened by heat treatment. Ferritic stainless steels typically contain between 10.5% and 27% chromium and very little nickel, if any.

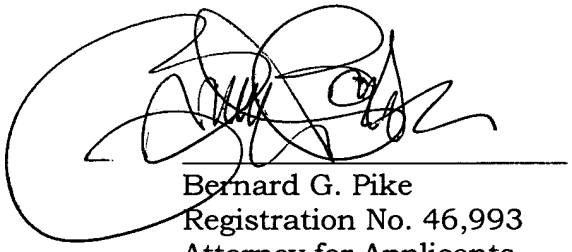
However, austenitic stainless steels comprise over 70% of total stainless steel production and typically contain a maximum of 0.15% carbon, a minimum of 16% chromium and sufficient nickel and/or manganese to retain an austenitic structure at all temperatures from the cryogenic region to the melting point of the alloy. Nickel is added to the stainless steel to stabilized the austenite structure of the iron and therefore the ferritic structure is precluded. This crystal structure makes such austenitic steels non-magnetic and less brittle at low temperatures. The Haynes Alloys all comprise too much nickel to be ferritic stainless steels and interconnects made from austenitic stainless steels will not function in a SOFC. *See specification as filed page 9, lines 13-14.*

For example, 556 has a UNS number of R30556 indicating that it is not a ferritic stainless steel (or even a stainless steel) but is classified in the Unified Numbering System for Metals and Alloys (UNS) as a "Reactive and refractory metal or alloy" and is considered a nickel cobalt alloy. 263 comprises a maximum of only 0.7 wt% of iron, is a nickel based alloy and cannot form the body centered cubic ferritic structure of a ferritic stainless steel. 120 comprises 37 wt% nickel well beyond the typical 0 to 2 wt% of nickel in a ferritic stainless steel. Applicant respectfully request reconsideration of the rejections of the claimed invention based upon the amendments and arguments presented in this Response to Office Action.

CONCLUSION

Applicants believe that they have fully addressed each basis for rejection under § 103(a). Reconsideration of the claims of the subject application and issuance of a Notice of Allowability is respectfully requested. Should the Examiner have any remaining concerns, he is requested to contact the undersigned at the telephone number below so that those concerns may be addressed without the necessity for issuing an additional Office Action.

Respectfully submitted,



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